

Ontario Hydro Electric Power Commission
General publications
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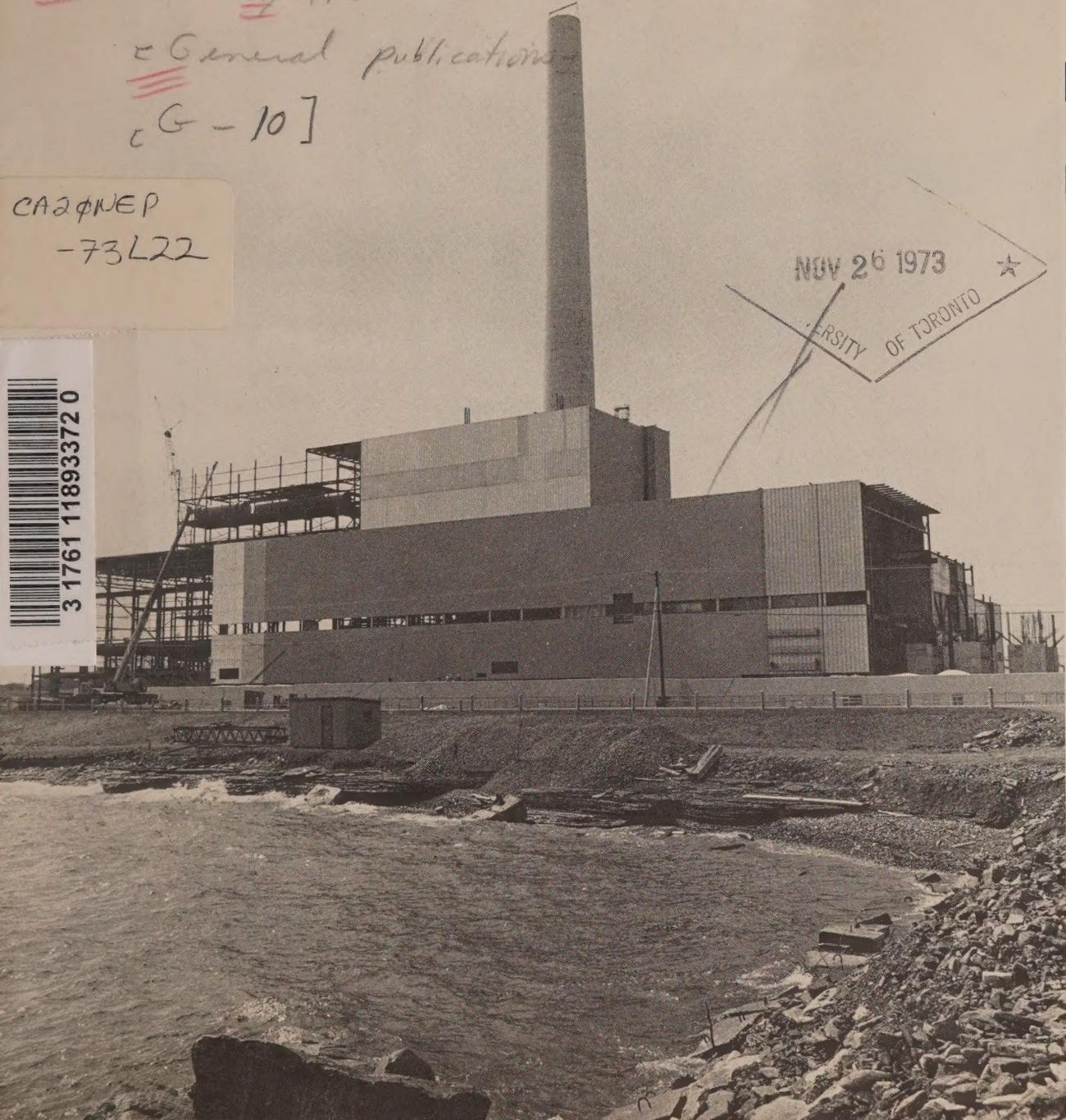
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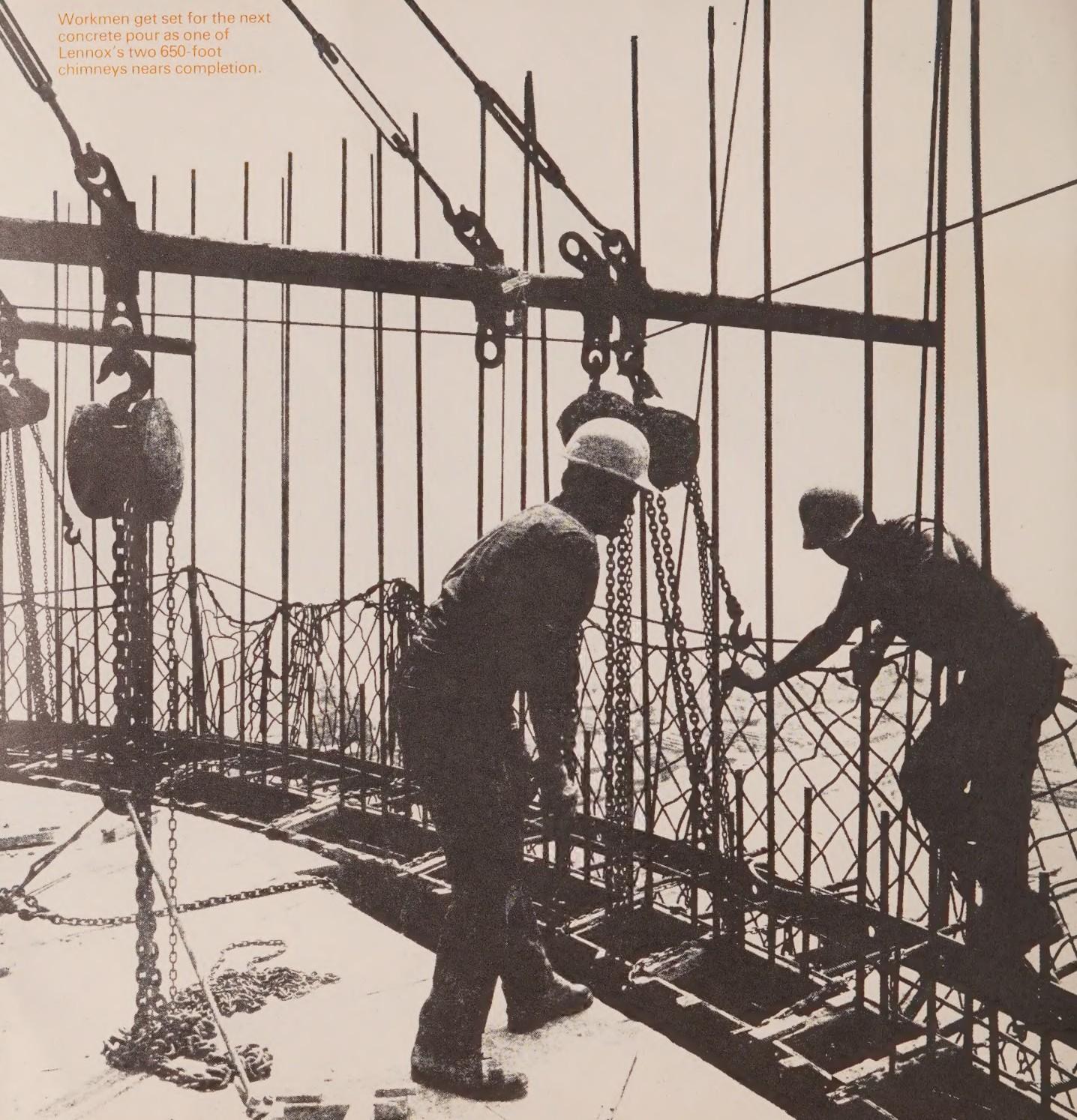
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UNIVERSITY OF TORONTO



Entomox G.

Workmen get set for the next concrete pour as one of Lennox's two 650-foot chimneys nears completion.



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Ontario Hydro's first oil-fired generating station is under construction on the shore of Lake Ontario near the community of Bath, 20 miles west of Kingston.

The Lennox station, named for the county of Lennox and Addington in which it is located, will produce 2,295,000 kilowatts.

All four units will be in service by 1977.

community asset

Every effort has been made to make the Lennox station a community asset as well as an economic, reliable source of power. Early in the design stage, attention was focussed on the historical significance of the Bath area, its great beauty and its importance as the gateway to a prime resort area.

Discussions were held with conservationists, planners, historians and other interested parties while engineers and architects were instructed to give priority to appearance and other environmental considerations.

These discussions resulted in a design change which actually turned the plant around to present a better appearance to the highway which runs along the lake. Other changes included finishing the powerhouse with gold-colored cladding.

Landscaping, siting, design and materials have all had to pass the dual criteria of functionalism and good appearance. For example, landscape planning consultants have devised a tree planting and screening program designed to blend natural beauty with the modern plant.

Immediately west of the station, earth mounds were reshaped to create scenic lookouts and picnic grounds. The waterfront has been left in its natural state, providing 40 acres of parkland for public use.

Ontario Hydro intends the Lennox development to be a tourist attraction.

site selection

Demands for electric energy have doubled every decade since the early 1900's and Eastern Ontario is no exception. However, several other

factors were taken into consideration before the actual site was selected.

These included a site relatively close to load centres to avoid long and costly transmission facilities; a solid rock foundation to support the station's heavy equipment; convenient road and rail transportation, and an abundance of deep, cold water for cooling purposes.

the plant

Scheduled for completion in 1977, Lennox will be the largest oil-fired plant in Canada.

With a capacity of 2,295,000 kilowatts, from four units, Lennox will produce about twice the combined power requirements of Ottawa and Hamilton. When operating at full capacity the plant will consume 3,120 barrels of oil an hour. Lennox will require a great deal of water for cooling purposes. This water will be circulated through condensers and returned to the lake slightly warmer, but just as clean.

When all four turbo-generators are operating at maximum capacity, they will require 848,000 gallons of water a minute for cooling purposes. Water will be pumped through a network of pipes at a rate of 573,000 gallons a minute to condense steam in the separate closed water-steam system. Before the cooling water is returned to the lake, its temperature will be reduced, or tempered, by mixing it with 275,000 gallons of cold water a minute.

choice of oil

Choice of fuel is one of the most important considerations in building a thermal-electric plant. For all fossil-fuelled stations, a coal-oil cost comparison study is undertaken because the cost and type of fuel can play a large role in the economics of the plant. During its lifetime, a conventional thermal station will consume fuel worth more than the total capital cost of the plant.

For Lennox, an internationally-known consulting engineering firm was engaged to carry out a study which included technical problems in

equipment design and selection, operating and maintenance problems, capital cost of the plant and projected operating and maintenance costs. The firm's report concluded that the capital cost of Lennox generating station would be as much as \$20 million lower if oil were used as a fuel. Estimated reductions in operating costs could save another \$2.3 million over the economic life of the station.

oil supply and handling

The initial oil supply contract calls for the delivery of 25 million barrels of residual oil to the plant between 1975 and 1980.

Crude oil will arrive at a refinery near Quebec City from Venezuela and Libya by tanker. The residual oil from the refinery operation will be transported overland by a specially designed 50 to 70-car unit train to Lennox G.S.

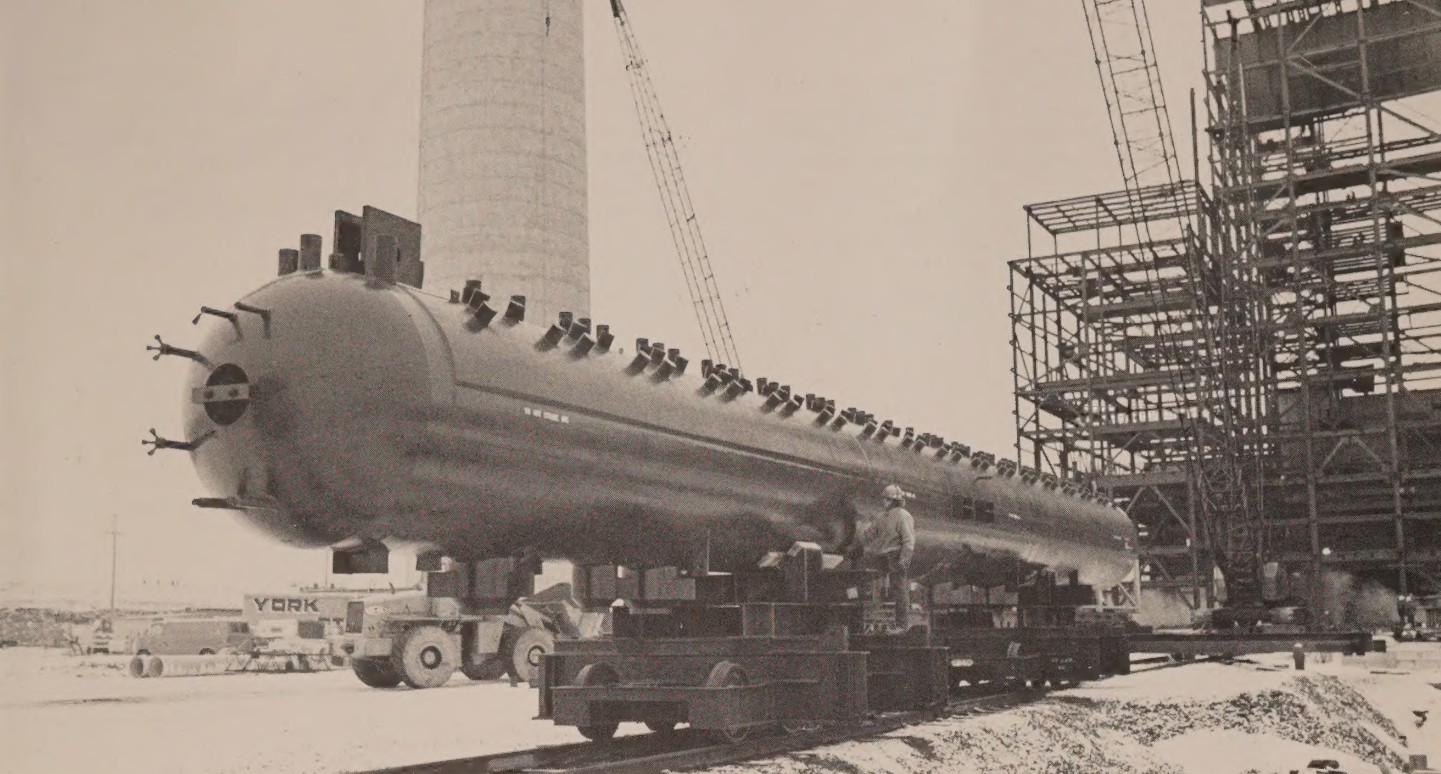
Unloading at the site will be accomplished as the train moves over a 450-foot-long catchpit at a speed of a quarter-of-a-mile an hour. At this rate, the train can discharge its full cargo in about four hours.

From the collecting pit, oil will be pumped either into the two day storage tanks directly behind the station, or to the three larger main storage tanks immediately west of the plant. These main storage tanks — the largest currently committed in North America — measure 360 feet in diameter and are 48 feet high. Each is capable of holding more than 800,000 barrels (a barrel of oil is 35 gallons). Dykes are being built around the tanks to contain all the oil should a serious leak develop.

the environment

Lennox will be one of the most modern fossil-fuel plants in the country and will embody the most efficient air and water quality control measures and equipment available.

Most noticeable of the plant's air quality control devices will be its 650 -foot stacks, which will enable flue gases to effectively penetrate temperature inversions and disperse effluents



One of the 240-ton steam drums arrives at the Lennox site to be hoisted into position 200 feet above ground level.

high into the upper atmosphere.

Tall chimneys, while they do not decrease the amount of pollutants emitted, are still the best known dispersal method. The wide dispersal ensures that harmful concentrations are averted at ground level.

However, to help reduce air pollution problems, a low-excess-air firing technique, used with great success in Europe and Japan, has been incorporated into the design at Lennox. This technique involves an accurate balancing of fuel oil and air — a process not possible with coal.

Highly efficient electrostatic precipitators will remove fly ash particles from exhaust gases. Oil contains approximately one-tenth of one per cent ash compared to about 10 per cent with coal.

Ontario Hydro researchers are now working on the development of a sulphur dioxide scrubbing

process which can be applied both at Lennox and Hydro's coal-fired stations. The station has been designed to incorporate SO₂ removal equipment when it becomes commercially available.

Water quality is an important environmental consideration, too. All warm water used for cooling purposes will be tempered, or mixed with additional amounts of cold water, before it's returned to the lake. This will permit the plant to operate under varying conditions while meeting all environmental regulations.

Intensive water quality control studies began in 1971 in the area that will be affected by the thermal plume. These studies will continue long after the station is in operation. They included water temperature and lake current surveys, aquatic weed studies, water sampling analysis,

facts about Lennox

Location:	Highway 33 on Lake Ontario near Bath, 20 miles west of Kingston	Gross capacity:	833,000 barrels each (2,499,000 barrels total)
Capacity:	2,295,000 kilowatts from four units	Day storage tanks:	Two tanks each 80 ft. diameter x 48 ft. high
In-service dates:	Unit 2 April 1975 Unit 1 February 1976 Unit 3 August 1976 Unit 4 February 1977	Capacity:	40,000 barrels each (80,000 barrels total)
Cooling water:	848,000 imperial gallons per minute at full load (573,000 for condenser cooling, 275,000 for tempering)	Maximum construction work force:	1300 in 1974
Site size:	1,560 acres	Permanent operating work force:	Approximately 200
Developed area:	850 acres	VISITORS	
Park area:	40 acres	Visitors are always welcome at Lennox generating station.	
Plant dimensions:	970 ft. long x 254 ft. deep	Winter Hours:	October to May 9 a.m. to 4.30 p.m. Monday to Friday.
Boiler bay:	190 ft. long with four boilers - each 152 ft. x 60 ft. x 35 ft.	Summer Hours:	May to October 9 a.m. to 4.30 p.m. Monday to Sunday, including holidays.
Stacks:	Two chimney stacks, each 653 ft. high - base diameter = 58 ft. - top diameter = 33 ft.	Individual and group tours may be arranged by calling:	
Fuel:	780 barrels of oil an hour per unit or 3,120 barrels an hour at full load.	613-352-3381 Community Relations Dept. Lennox generating station P.O. Box 1000 Bath, Ontario	
Main oil storage tanks:	Three tanks each 360 feet diameter x 48 ft. high	or write:	

fish species identification, population and spawning ground surveys, phytoplankton, zooplankton and bottom fauna analysis, and studies on the behavior of the cooling water plume.

the community

Bath owes its origin to the United Empire Loyalists who settled there as early as 1784 and named it Ernestown.

It's a pleasant village of 850 people, but at one time it had double that population and was a serious industrial and commercial rival to Kingston. The community, which was renamed Bath in 1812, was the site of the launching of the Frontenac in 1816, the first steam boat to sail the Great Lakes.

Shipbuilding, carriage manufacturing and related

trades were the major industries. As the story goes, a wealthy landowner held out for a high price for land to be used by the Grand Trunk Railway near Bath and another route was chosen. Bath declined in importance and Kingston moved ahead when a major military and naval base was established there.

Subsequently, Bath has become the gateway to the scenic and quiet Quinte resort area.

Residents of the village are happy with their peaceful surroundings and don't want them to change drastically. Ontario Hydro is co-operating with them in every way possible.

While erection of the generating station will provide employment for 1,300 people at the peak of construction and give the community an economic boost, every step is being taken to retain the serenity so rightly prized by local residents.

